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Osamu Katayama

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EXAMINER

HUNG, YUBIN

ART UNIT

PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/827,179

Applicant(s)

KATAYAMA ET AL.

Examiner

Yubin Hung

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-60 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20, 23-44, 47,-60 is/are rejected.
- 7) ☒ Claim(s) 21-22,45-46 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04/06/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Claim Objections

1. Claims 4 and 5 are objected to because of the following informalities:
 - Claim 4, line 4: both instances of "modified" should have been "remaining"
(Note: For examination purpose, hereinafter claim 4 and all its dependent claims will be interpreted as if the correction has been made.)
 - Claim 5, line 4: Per page 11, lines 24-26, "increase a spatial frequency of the image" should be changed to read "has caused spatial frequency of image to increase" for clarity. (Note: For examination purpose, hereinafter claim 5 and all its dependent claims will be interpreted as if the change has been made.)

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 20, 23-39, 47, 51, 56 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 20 recites the limitation "the coding means" in line 3. There is insufficient antecedent basis for this limitation in the claim.

(Note: for examination purpose, hereinafter "the coding means" will be interpreted as "data compressing means" to be consistent with claim 3 or claim 4.)

5. Claim 23 recites the limitation "the all-selected color position data" in lines 4-5. There is insufficient antecedent basis for this limitation in the claim. Claims 24-39, being depending on claim 23, are similarly rejected.

(Note: for examination purpose, hereinafter "the all-selected color position data" will be interpreted as "an all-selected color position data.")

6. Claim 47 recites the limitation "the respective pairs" in lines 3-4 and "the pair" in line 5. There is insufficient antecedent basis for this limitation in the claim.

7. Claim 51 recites the limitation "the two landmarks" in line 5. There is insufficient antecedent basis for this limitation in the claim.

(Note: for examination purpose, hereinafter "the two landmarks" will be interpreted as "two landmarks.")

8. Claim 56 recites the limitation "the symbol or the road" in line 5. There is insufficient antecedent basis for this limitation in the claim.

(Note: for examination purpose, hereinafter "the symbol or the road" will be interpreted as "a symbol or a road.")

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –
(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

9. Claims 1-3, 4 (as interpreted), 5, 10, 14, 40, 59 are rejected under 35 U.S.C.

102(a) as being anticipated by Silverbrook (US 6,002,847).

10. Regarding claim 3, and similarly claims 1, 2, 4, 14 and 59, Silverbrook discloses:

- color selecting means for selecting an arbitrary color from the image data
[Fig. 8, numeral 1054; Fig. 9; Col. 38, lines 33-67 (especially lines 66-67); Col. 40, lines 37-40-54. Note that the selected color is black and that color selection is performed by the compression system]
- data separating means for separating the image data into modified data and position data, the modified data being produced by modifying a color of an image portion selected by the color selecting means by a color surrounding the image portion, and the position data indicating a position where the color image portion selected by the color selecting means is present
[Fig. 9, numeral 1101; Col. 40, lines 53-57. Note that the cell 1101 corresponds to the image under consideration, the bit map corresponds to the position data, the pixels with their color replaced corresponds to the modified data and the remaining pixels constitute the remaining data. Further note that the replacing color is the color of a nearest, i.e., surrounding, pixel]
- data compressing means for compressing the modified data and the position data separately
[Fig. 8, numeral 1054; Fig. 9, numerals 1109, 1110; Col. 40, lines 54-55 (compressing the position data); Col. 41, lines 5-33 (compressing the modified data and the remaining data)]

11. Regarding claim 5 (as interpreted), which has the additional limitation that the color selecting means selects a color that causes the spatial frequency of the image to increase, it is noted that any selected color meets this condition since if this color (out of, say, N colors used in the original image) has not been used in the first place, this color will have been replaced by one the remaining N-1 colors of the image. Therefore, the sizes of some connected blocks of pixels (each block having one color) will more be larger and, in turn, will result in less spatial variation if the selected color has not been used. In other words, there will be increased spatial variation if the selected color has been used. Consequently, this additional limitation is inherently satisfied and claim 5 is similarly analyzed and rejected as per claim 3.

12. Claim 10 is similarly analyzed and rejected as per claim 5. This is because, as the analysis of claim 5 demonstrates, any selected color has caused the spatial frequency to increase, therefore the act of selection inherently encompasses detection.

13. Claim 40 is a medium claim for claim 3 or 4 and therefore is similarly analyzed and rejected as per the analysis of claim 3 or 4.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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15. Claims 6, 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847) as applied to claims 1-5, 10, 14, 40, 59, further in view of Zsagar (US 3,997,912).

16. Regarding claim 6, and similarly claim 11, Silverbrook discloses everything except the following, which Zsagar teaches:

- the color selecting means selects a color which are relatively used frequently within the image data
[Col. 18, lines 20-24. Further note that specific to claim 11, the detection of the most frequently occurred color is inherent]

Zsagar and Silverbrook are combinable because they have aspects that are from the same field of endeavor of image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook with the teaching of Zsagar by selecting a relatively frequently used color as the replacing color. The motivation would have been to increase the size of uniform color region(s) so as to achieve better compression efficiency.

Therefore, it would have been obvious to combine Zsagar with Silverbrook to obtain the invention specified in claim 6.

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17. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847) as applied to claims 1-5, 10, 14, 40, 59, further in view of Bormans et al. (US 6,058,211).

18. Regarding claim 7, Silverbrook discloses everything except the following, which Bormans et al. teaches:

- the color selecting means selects a road color contained in a map as a color which increases the spatial frequency, when the image data corresponds to the map
[Col. 9, lines 53-57]

Bormans et al. and Silverbrook are combinable because they have aspects that are from the same field of endeavor of compression.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook with the teaching of Bormans et al. by selecting the color of a linear feature such as a road when the image is a map containing roads. The motivation would have been to be able to represent such features with a more efficient means such as a chain code.

Therefore, it would have been obvious to combine Bormans et al. with Silverbrook to obtain the invention specified in claim 7.

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19. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847) and Zsagar (US 3,997,912) as applied to claims 6, 11, further in view of Takaoka (US 5,937,099).

20. Regarding claim 8, Silverbrook and Zsagar disclose everything except the following, which Takaoka teaches:

- the color selecting means selects a background color contained in a map as a color, when the image data corresponds to the map [Fig. 1, numeral 116; Col.3, lines 7-10. Note that the binary portion of the image in the reference is considered the background and a background color (with value 0) is selected. That a background color is selected remains true when the image data is a map, according to the teaching of the reference. Further note that a background color occurs relatively frequently in an image]

Takaoka, Zsagar and Silverbrook are combinable because they have aspects that are from the same field of endeavor of image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook and Zsagar with the teaching of Takaoka by selecting a relatively frequently used background color of an image (including images corresponding to maps) as the replacing color. The motivation would have been to increase the size of uniform color region(s) so as to achieve better compression efficiency.

Therefore, it would have been obvious to combine Takaoka with Zsagar and Silverbrook to obtain the invention specified in claim 8.

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21. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847) as applied to claims 1-5, 10, 14, 40, 59, further in view of Otto (US 6,244,514).

22. Regarding claim 9, Silverbrook discloses everything except the following, which Otto teaches:

- the color selecting means selects a color which is instructed from an external device for executing a predetermined application software process operation by using the image data
[Fig. 13; Col.7, lines 45-55. Note that the existence of an external device to interact with the operator is inherent.]

Otto and Silverbrook are combinable because they have aspects that are from the same field of endeavor of image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook with the teaching of Otto by including an external device for inputting instruction from an operator. The motivation would have been to give user control over the selection of replacing colors that best suite his/her purpose.

Therefore, it would have been obvious to combine Otto with Silverbrook to obtain the invention specified in claim 9.

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23. Claims 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847) as applied to claims 1-5, 10, 14, 40, 59, further in view of Chen (US 5,974,172).

24. Regarding claim 12, similarly claim 13, Silverbrook discloses everything except the following, which Chen teaches:

- the color selecting means selects a plurality of colors; and the position data is set by 1 bit for each of the plurality of colors [Fig. 3, numerals 302, 304; Col.7, lines 52 - Col. 8, line 13. Note that each region has its own replacement color (Col. 8, lines 5-12).]
- the position data is set by 1 bit for each of the plurality of colors [Fig. 7, numeral 702; Col.7, lines 37-42. Note that the two values (a and 2) designating the two different regions (with one corresponds one color) can be represented by one bit; i.e., 702 is equivalent to a bit map. Further note that if there are 2^n-1 regions (i.e., colors), then each entry of 702 will be indicated by n bits.]

Chen and Silverbrook are combinable because they have aspects that are from the same field of endeavor of image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook with the teaching of Chen by selecting a plurality of colors and using bit maps, one for each color, to represent its corresponding position data. The motivation would have been to be able to compress regions differently according to their relative importance [Col. 10, line 46 - Col. 11, line 15].

Therefore, it would have been obvious to combine Chen with Silverbrook to obtain the invention specified in claim 12.

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25. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847) as applied to claims 1-5, 10, 14, 40, 59, further in view of Shimizu et al. (US 6,668,021).

26. Regarding claim 15, Silverbrook discloses everything except the following, which Shimizu teaches:

- data converting means for converting the image data to reduce entropy [Fig. 4, numeral 108; Col. 4, lines 32-39. Note that per line 35, run-length encoding is performed as part of numeral 108 to reduce entropy]
- coding means for allocating a variable length code to the data converted by the data converting means [Fig. 4, numeral 108; Col. 4, lines 32-39]
- coding amount control means for controlling a data amount of image data coded by the coding means [Fig. 4, numeral 111; Col. 4, lines 52-56]
- wherein the data converting means executes a converting process operation by way of a 2-value run-length conversion with respect to the position data, and also executes a converting process operation by way of a multi-value run-length conversion with respect to the modified data or the remaining data [Fig. 4, numeral 108. Note that it is well known in the art that if the data is made up by binary values (which is the case for the position data) then a 2-value scheme is used. On the other hand, if the data has more than two values, then a multi-value version is used]

Shimizu et al. and Silverbrook are combinable because they have aspects that are from the same field of endeavor of image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook with the teaching of Shimizu et al. by using a compressing device

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composing a variable-length encoding circuit that performs run-length/Huffman encoding and controlled by a code amount control circuit. The motivation would have been to apply a tried and true compression technique to efficiently reduce the amount of data while reduce the cut away overflow data so that the deterioration of image quality in decoding the image is prevented. [See Col. 4, lines 53-57 of Shimizu.]

Therefore, it would have been obvious to combine Shimizu et al. with Silverbrook to obtain the invention specified in claim 15.

27. Claims 16, 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847) as applied to claims 1-5, 10, 14, 40, 59, further in view of Shimizu et al. (US 6,668,021) and Kondo et al. (US 5,850,261).

28. Regarding claim 16, Silverbrook discloses everything except the following, which Shimizu et al. and Kondo et al. teaches:

- data converting means for converting the image data to reduce entropy [Shimizu et al.: Fig. 4, numeral 108; Col. 4, lines 32-39. Note that per line 35, run-length encoding is performed as part of numeral 108 to reduce entropy]
- coding means for allocating a variable length code to the data converted by the data converting means [Shimizu et al.: Fig. 4, numeral 108; Col. 4, lines 32-39]
- coding amount control means for controlling a data amount of image data coded by the coding means [Shimizu et al.: Fig. 4, numeral 111; Col. 4, lines 52-56]
- the data converting means executes a converting process operation by way of a 2-value run-length conversion with respect to the position data, and also executes a converting process operation by way of the 2-value run-length conversion with respect to the modified data or the remaining data in such a manner that either the modified data or the remaining data is resolved into a plurality of bit planes, and the data

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of each of the bit planes are sequentially converted by the 2-value run-length conversion either serially or in parallel [Kondo et al.: Abstract, lines 1-7; Fig. 2, numerals 3, 4; Col. 9, lines 44-51. Note that since each bit plane contains binary data, it is obvious to use a 2-value run-length encoder]

Kondo et al., Shimizu et al. and Silverbrook are combinable because they have aspects that are from the same field of endeavor of image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook with (1) the teaching of Shimizu et al. by using a compressing device composing a variable-length encoding circuit that performs run-length/Huffman encoding and controlled by a code amount control circuit and (2) the teaching of Kondo et al. by using a 2-value run-length encoder on each individual bit planes. The motivation would have been to apply a tried and true compression technique to efficiently reduce the amount of data while reduce the cut away overflow data so that the deterioration of image quality in decoding the image is prevented [see Col. 4, lines 53-57 of Shimizu et al.] and also that when a better compression ratio and lower processing time are desired, a number of the least significant bit planes can be dropped (and therefore the encoding step is skipped). In addition, when the most significant bit planes only contain 0, an even more efficient compression can be achieved.

Therefore, it would have been obvious to combine Kondo et al. and Shimizu et al. with Silverbrook to obtain the invention specified in claim 16.

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29. Regarding claim 17, Shimizu et al. further teaches:

- the coding amount control means compresses either the modified data or the remaining data in a lossy manner, and executes the data compressing process operation in a relatively high compression ratio [Fig. 4, numeral 111; Col. 4, lines 52-56. Note that since the quantity of code generated is suppressed, the encoding is lossy]

30. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847), Shimizu et al. (US 6,668,021) and Kondo et al. (US 5,850,261) as applied to claims 16, 17 above, further in view of Wang et al. (US 6,088,395).

31. Regarding claim 18, Silverbrook, Shimizu et al. and Kondo et al. disclose everything except the following, which Wang et al. teaches:

- the coding amount control means controls the coding amount in such a manner that a lossy data compressing process operation is carried out by sequentially cutting off the bit planes from such a bit plane having a low order with respect to the coding amount which is produced by coding either the modified data or the remaining data by the coding means [Col. 2, lines 10-12]

Wang et al., Kondo et al., Shimizu et al. and Silverbrook are combinable because they have aspects that are from the same field of endeavor of compression.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook, Shimizu et al. and Kondo et al. with the teaching of Wang et al. by using truncation of least significant bits to reduce the code amount. The motivation

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would have been that in addition to being simple and effective, the approach also preserves the more important information about the data, which is in the more significant bit.

Therefore, it would have been obvious to combine Wang et al. with Kondo et al., Shimizu et al. and Silverbrook to obtain the invention specified in claim 18.

32. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847), Shimizu et al. (US 6,668,021) and Kondo et al. (US 5,850,261) as applied to claims 16, 17 above, further in view of Normile et al. (US 5,212,742).

33. Regarding claim 19, Silverbrook, Shimizu et al. and Kondo et al. disclose everything except the following, which Normile et al. teaches:

- the data converting means executes a DCT process operation with respect to either the modified data or the remaining data, instead of the run-length conversion
[Fig. 1, numerals 101-103; Col. 5, lines 55-58]

Normile et al., Kondo et al., Shimizu et al. and Silverbrook are combinable because they have aspects that are from the same field of endeavor of compression.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook, Shimizu et al. and Kondo et al. with the teaching of Normile et al.

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by executing a DCT process operation. The motivation would have been to be able to convert spatial data into frequency data so that different frequencies can be quantized differently if desired to achieve a higher degree of compression and yet not cause too much distortion.

Therefore, it would have been obvious to combine Normile et al. with Kondo et al., Shimizu et al. and Silverbrook to obtain the invention specified in claim 19.

34. Claim 20 (as interpreted) is rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847) and Zsagar (US 3,997,912) as applied to claims 6, 11, further in view of Otto (US 6,244,514).

35. Regarding claim 20, Silverbrook and Zsagar disclose everything except the following, which Otto teaches:

- the coding means executes the variable coding process operation by way of Huffman coding operation
[Fig. 5, block labeled "Codebook Compression;" Col.10, lines 6-8]

Otto, Zsagar and Silverbrook are combinable because they have aspects that are from the same field of endeavor of image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook and Zsagar with the teaching of Otto by using Huffman coding

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operation to compress the image portion. The motivation would have been to be able to compress efficiently with losing the fidelity of the image data since Huffman encoding is lossless.

Therefore, it would have been obvious to combine Otto with Zsagar and Silverbrook to obtain the invention specified in claim 20.

36. Claims 41, 43, 44, 48-50, 52, 54, 57, 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. (US 5,850,261), in view of Yamakado et al. (US 6,014,133).

37. Regarding claim 41, and similarly claims 43, 48 and 58, Kondo et al. discloses:

- data converting means for solving image data having a multiple value, which is expressed by a color palette system, into bit planes, and also for sequentially executing a 2-value run-length converting process operation with respect to the data of each of the bit planes and coding means for allocating a code to the data converted by the data converting means
[Abstract, lines 1-7; Fig. 2, numerals 3, 4; Col. 9, lines 44-51. Note that since each bit plane contains binary data, it is obvious to use a 2-value run-length encoder]

Kondo et al. does not expressly disclose the following, which Yamakado et al. teaches:

- reconstructing means for reconstructing the color palette prior to a data converting operation by the data converting means in such a manner that indexes of pixels are approximated to be close to each other, and the pixels are continued in a data processing sequence within the image data
[Fig. 12, numerals 14, 15; Fig. 18; Col. 3, lines 1-10; Col. 4, lines 28-31. Note that numeral 15 (index converter) corresponds to the reconstructing means (which can perform the conversion described in Fig. 18)]

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Yamakado et al. and Kondo et al. are combinable because they have aspects that are from the same field of endeavor of compression.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Kondo et al. with the teaching of Yamakado et al. by reassigning color index in the image scan order (i.e., the pixels are "continued" in a data processing sequence).

The motivation would have been to take advantage of the tendency that nearby pixels tend to have a similar color. [See also Yamakado et al., Col. 3, lines 8-10.]

Therefore, it would have been obvious to combine Yamakado et al. with Kondo et al. to obtain the invention specified in claim 41.

38. Regarding claim 44, Yamakado et al. further discloses

- the reconstructing means sequentially allocates the color indexes of the color palette in correspondence with a sequence of colors whose amounts of use are large within the image data
[Col. 2, lines 58-62]

39. Claim 49 is similarly analyzed and rejected as per claim 41 since when the image data is a map, specific elements such as pixels constituting an elongated, horizontal feature such as a, east-to-west street will have indexes close to each other.

40. Claims 50, 52, 54 are similarly analyzed and rejected as per claim 49 since a special element in a map can be anything, including a landmark, a road, a symbol and a background if they are present.

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41. Regarding claim 57, Kondo et al. further teaches the use of variable length code [Abstract: lines 4-5. Note that a Huffman code is a variable-length code].

42. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo et al. (US 5,850,261) and Yamakado et al. (US 6,014,133) as applied to claims 41, 43, 44, 48-50, 52, 54, 57, 58 above, further in view of Passaggio et al. (US 6,208,761)

43. Regarding claim 42, Kondo et al. and Yamakado disclose everything except the following, which Passaggio et al. teaches:

- the reconstructing means allocates the indexes so that the number of planes which have same values between data of corresponding planes relatively increases with respect to the indexes which are approximated to be close in a reconstructing operation
[Col. 3, lines 19-22. Note that since adjacent Gray-coded indexes differ by only one bit, this will increase the number of same-valued bit planes for indexes that are approximated to be close]

Passaggio et al., Yamakado and Kondo et al. are combinable because they have aspects that are from the same field of endeavor of compression.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Kondo et al. and Yamakado with the teaching of Passaggio et al. by allocating indexes according to the order of gray codes. The motivation would have been to

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maximally exploit the redundancy of the bit planes. [See Passaggio et al., Col. 3, lines 20-21.].

Therefore, it would have been obvious to combine Passaggio et al. with Condo et al. and Yamakado to obtain the invention specified in claim 42.

44. Claim 60 is rejected under 35 U.S.C. 103(a) as being unpatentable over Silverbrook (US 6,002,847) as applied to claims 1-5, 10, 14, 40, 59 above, further in view of Yamazaki (US 5,926,563).

45. Regarding claim 60, Silverbrook discloses everything except the following, which Yamazaki teaches:

- means for variably switching the arbitrary color to be selected by the color selecting means
[Col. 2, lines 12-15]

Yamazaki and Silverbrook are combinable because they have aspects that are from the same field of endeavor of image processing.

At the time of the invention it would have been obvious to one of ordinary skill in the art to modify Silverbrook with the teaching of Yamazaki by switching the arbitrary color to be selected by the color selecting means. The motivation would have been to give

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users of the system the option of selecting the best color or to have the system automatically present results from different selected color for users to select from.

Therefore, it would have been obvious to combine Yamazaki with Silverbrook to obtain the invention specified in claim 60.

Allowable Subject Matter

46. Claims 21-39, 45-47, 51, 53, 55, 56 contain allowable subject matter.

47. Claims 21-22, 45, 46, 53, 55 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

48. Claims 23, 47, 51 and 56 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims as well as rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action. Claims 24-39, being dependent on claim 23, would be allowable if claim 23 is thus rewritten or amended.

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49. The following is a statement of reasons for the indication of allowable subject matter:

50. Regarding claim 23, and similarly claims 21 and 22, the prior art of record fails to teach or suggest, alone or in combination, the data separating means of an image compressing apparatus comprising, along with other limitations:

- first data separating means for separating the image data into the position data, the remaining data and the all-selected color position data, the position data being constituted only by the selected color, the remaining data being produced by extracting data of plural color image portions selected by the color selecting means from the image data, and the all-selected color position data indicating a position where all of the selected color image portions are present
- second data separating means operated in such a manner that the position data separated by the first data separating means is sequentially separated into position data and an image in an order of predetermined selected colors, the selected colors being located in the position data, and the image being produced by extracting the selected colors
- wherein the data compressing means separately compress both the remaining data and the all-position data which are separated by the first data separating means and the position data of the respective selected colors separated by the second data separating means

Among the closest prior art of record, Silverbrook (US 6,002,847) discloses a first data separating means as well as a compressing means that separately compresses the separated position data and remaining data. [See the analysis of claim 3.] In addition, Revankar (US 5,649,025) discloses recursive separation of image portions [see Abstract]. However, neither Silverbrook nor Revankar teaches the use of a second data separating means to separate image portions in an order of predetermined selected colors.

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51. Regarding claim 45, the prior art of record fails to teach or suggest, alone or in combination, the data separating means of an image compressing apparatus comprising, along with other limitations:

- the reconstructing means determines a pair of two colors by employing a determining method that among data located preceding to and following a color of interest, the largest amount of such a color other than the color of interest is used as an index of a color located preceding to and following the color of interest, determines a pair of such colors which have not yet determined in a recursive manner based upon the determining method, and then arranges the color palette every paired color

The closest prior art of record, Sanford, II et al. (US 5,819,289) discloses a method for identifying pairs of color entries recursively from a palette based on a certain criteria.

[Fig. 3A; Col. 6, lines 9-49.] However, Sanford's method starts from the first color in the palette and finds the color to be paired with it from all succeeding colors in the palette, instead of from both the preceding and the succeeding colors. In addition, the method may leave many colors in the palette un-paired because they may not form pairs that satisfy the criteria.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (703) 305-1896. The examiner can normally be reached on 7:30 - 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (703) 308-5246. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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April 12, 2004


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